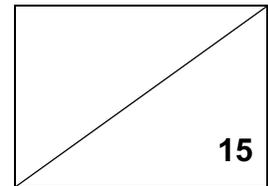## 2020 Sec 3 Physics Practical 7

Waves: Reflection of Light (method of no parallax)

Marking Scheme

15

Record of i and r (total 3 marks)

- Neat table drawn with the headings and units (**i /° and r /°**) [1]
- At least 6 sets of evenly spread readings of **i** taken from 20° (inclusive of 20°) to 80° with minimum range of 50°. [1]
- **i** and r tabulated to zero d.p (whole numbers) [1]
- *Extend graph to cut axes.*

Ray Diagram (total 2 marks)

- Pins separation of P_1 and P_2 (or P_3 and P_4) must be at least 5.0 cm [1]
- Reflected ray drawn must be through the centre of the pinholes of P_3 and P_4. [1]
- *Label all angles of incidence & reflection!*

Graph (total 4 marks)

- **S**: Suitable <u>scale</u> used. [1]
- **P**: All <u>points</u> correctly plotted. [1]
- **L**: <u>Line</u> of best fit passing through the origin (or close to origin). [1]
- **A**: <u>Axes</u> correct (i on y-axis and r on x-axis); correctly labelled (with or without units) from origin with values labelled at regular intervals on both axes. [1]
- *Label intersection of axes!*

Calculation of gradient (total 4 marks)

- On the graph
  - **C**: <u>Coordinates</u> of two suitable points clearly indicated. [1]
  - **T**: Large <u>triangle</u> drawn using the two chosen points along line of best fit. [1]
- Calculation of gradient using the coordinates on the graph
  - Show working $(y_2 - y_1) / (x_2 - x_1)$ [1]
  - Answer = 1.0 ± 0.1 (2 s.f.) [1]

Conclusion

<u>i = r.</u> or angle of incidence <u>i is directly proportional to</u> angle of reflection <u>r</u>. [1]

Questions

1 State **one** precaution that you have taken in this experiment.

- <u>The optical pins must be vertically upright to ensure the correct alignment of the pins P_3 and P_4 with the images of P_1 and P_2.</u> [1]
  OR
- <u>The pins P_3 and P_4 must be as far apart as possible (at least 5.0 cm apart) to ensure the accuracy of the reflected ray drawn through these pinholes.</u>
- <u>The mirror was checked to be at the same location when taking every set of measurements.</u>